

# **SINGLE-TUBE RETRACTABLE HANDLE ASSEMBLY**

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

5           The present invention relates to a carrying tool, and more particularly to a single-tube handle assembly of a luggage, a handcart and the like.

### **2. Description of the Related Art**

FIG. 1 shows a conventional luggage 200, which comprises a case 210, two wheel assemblies 220 installed at the bottom of the case 210, and a retractable handle 230 at the top of the case 210. The retractable handle 230 has two retractable tubes 232 and 234 and a handle bar 236 connected with distal ends of the retractable tubes 232 and 234. The retractable tubes 232 and 234 have controllers (not shown) therein to control the retractable tubes 232 and 234 being elongated and retracted.

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The conventional retractable handle 230 has a larger size so that it will take a larger space in the case 210 and make the luggage heavier. The conventional retractable handle 230 also has a higher cost to manufacture them, and more particularly, they cannot attract consumers' attention to buy the luggage anymore.

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## **SUMMARY OF THE INVENTION**

20           The primary objective of the present invention is to provide a single-tube retractable handle assembly for a luggage, which has smaller size, lighter weight and lower cost.

According to the objective of the present invention, a retractable handle assembly comprises a retractable tube having two or more tubes engaged with each other and at least a controller received in the tube, wherein an engagement portion is

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provided at an end of the retractable tube. A handle has a grip portion and an axle portion, wherein an engagement portion is provided at an end of the axle portion. The handle is pivoted on the retractable tube with the engagement portion of the handle corresponding to the engagement portion of the retractable tube, and a lock device is  
5 movably mounted on the retractable handle assembly at where a junction between the retractable tube and the handle. The lock device is moved between a first position, in which the lock device is engaged with both of the engagement portions of the retractable tube and the handle, and a second position, in which the lock device only is engaged with one of the engagement portions of the retractable tube and the handle.

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#### **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a perspective view of a conventional luggage;

FIG. 2 is a perspective view of the luggage of a preferred embodiment of the present invention;

15 FIG. 3 is an exploded view of the retractable handle of the preferred embodiment of the present invention;

FIG. 4 is a sectional view of the handle and a part of the retractable tube of the preferred embodiment of the present invention, showing the lock device rested at the first position in which the handle is locked by the lock device;

20 FIG. 5 is a sectional view following FIG. 4, showing the lock device being moved to the second position to release the handle, so that the handle is able to be rotated;

FIG. 6 is a sectional view similar to FIG. 4, showing the button is pressed to activate the controller in the tube;

25 FIG. 7 is a back view of the luggage of the preferred embodiment of the

present invention, showing the grip portion of the handle being rotated to right;

FIG. 8 is a back view of the luggage of the preferred embodiment of the present invention, showing the grip portion of the handle being rotated to left, and

## 5 DETAILED DESCRIPTION OF THE INVENTION

As shown in FIG. 2, a luggage 1 has a case 2, two wheel assemblies 4 installed at the bottom of the case 2 and a single-tube retractable handle assembly 6 installed at the top of the case 2, wherein the single-tube retractable handle assembly 6 of the preferred embodiment of the present invention comprises:

10 A retractable tube 10, as shown in FIGS. 3 and FIG. 4, is composed of four tubes 12, 14, 16 and 18 engaged with each other and three controllers 20 installed in the tubes. The tubes 12, 14, 16 and 18 are substantially elliptical in cross-sections. The tubes 12, 14, 16 and 18 are retractable and the controllers 20 are to lock and unlock the tubes 12, 14, 16 and 18. The controllers 20 are conventional elements, you can find the  
15 detail structure in U.S. Pat. 5,806,143, U.S. Pat. 6,357,080 or in other relative inventions. A tube plug 22 is secured at a distal end of the tube 18 that is the outer tube of the retractable tube 10 by two pins 24. The plug 22 has an engagement portion 26 at a top, an annular flange 28 adjacent to the engagement portion 26, two blocks 30 received therein, a hole 32 from the top to a bottom and a side hole 34 communicated  
20 with the hole 30.

A handle 36 has a grip portion 38 and an axle portion 40 wherein the axle portion 40 has an axis of rotation 42 and the grip portion 36 located aside from the axis of rotation 42. The handle 36 has a recess 44 at a top of the axle portion 40, a chamber 46 at a bottom of the axle portion 40 and a hole 48 communicated with the recess 44  
25 and chamber 46. A soft piece 58 is attached on the grip portion 38 to provide user a

comfortable condition to grip it. A button 60 is received in the recess 44 and a spring 62 is mounted under the button 60 to urge the button 60 upwards. A rod 64 has a midsection received in the hole 48, a top section in the recess 44 and a bottom section in the chamber 46. A top end of the rod 64 is fixed to the button 60 to be shifted along  
5 with the button 60. The rod 64 further has a driving device 66 extended along a diameter orientation and received in the chamber 46. A handle plug 68 is secured at a bottom end of the chamber 46 by two screws 70. The handle plug 68 has an engagement portion 72 at a bottom thereof exposed out of the chamber 46. The handle plug 68 has a hole 74 extended through from a top to the bottom and a slot 76 beside  
10 the hole 74. A supporting device 78 has a rib 80 extended upwards and a hole 82 beside the rib 80. The supporting device 78 is received in a recess 83 at the bottom of the handle plug 68 with the rib 80 squeezed into the slot 76. The supporting device 78 enhances the strength of the handle plug 68.

A shift 84 is received in the holes 32, 74 and 82 of the tube plug 22, the  
15 handle plug 68 and the supporting device 78. A pin 86 is inserted into the side hole 34 of the tube plug 22 and squeezed into a recess 88 of the shift 84 to secure the shift 84 with the tube plug 22. The shift 84 has a tunnel 90 and a head portion 92 at a top thereof received in the chamber 46 of the handle 36. The diameter of the head portion 92 is greater than the diameter of the hole 74 of the handle plug 68 to prevent the  
20 handle 36 escaped from the retractable tube 10. The shaft 84 serves as an axle of rotation to make handle 36 rotated relative to the retractable tube 10.

A transmission device 94 has a first bar 96, a connector 98, a second bar 100 and a stand 102. The first bar 96 has a midsection received in the tunnel 90 of the shaft  
25 84, a top end extruded out of the shaft 84 and against the driving device 66 of the rod

64 and a bottom end connected with the connector 96. The connector 96 is located under the tube plug 22 having a slot 104 at a bottom thereof. The second bar 100 has a top end rested in the slot 104 and a bottom end against the controller 20. The stand 102 is received in the tube 18 having a hole 106 for the second bar 100 through.

5           As shown in FIG. 6, the button 60 is pressed downwards to force the rod 64 shifting downwards too, and then the driving device 66 presses the first bar 96 to make the first bar 96, the connector 98 and the second bar 100 shifting downwards, such that the second bar 100 activates the controller 20 to unlock the tubes 12, 14, 16 and 18. While the button 60 is no long pressed, a spring (not shown) in the controller 20 urges  
10   the second bar 100 upwards so that the elements described above will return their initial positions.

          A lock device 108 is a ring in the present invention. The lock device 108 is installed at where a junction portion between the handle 36 and the retractable tube 10. The lock device 108 is moved between a first position, as shown in FIG. 4, in which  
15   the lock device 108 is engaged with both of the engagement portions 26 and 72 of the tube plug 22 and the handle plug 68, and a second position, as shown in FIG. 5, in which the lock device 108 is moved upwards and engaged only with engagement portions 72 of the handle plug 68. In the first position, the lock device 108 serves as a coupling making the handle 36 not rotated. In the second position, the lock device 108  
20   is no longer coupled with the retractable tube 10 so that the handle 36 is rotated freely.

          There are several characters of the present invention having to mentioned:

          As shown in FIG. 7 and FIG. 8, the handle 36 is twisted with the grip portion 38 at a right side or a left side that facilitates user to hold the handle 36 by right hand or left hand so that user can pull the luggage 1 moving in a stable condition, no matter  
25   a right-handed user or a left-handed user.

The engagement portions 26 and 72 of the tube plug 22 and the handle plug 68 are elliptical in cross-sections and the lock device 108 has a sharp corresponding the engagement portions 26 and 72. In fact, the engagement portions 26 and 72 can have shapes of not round, such as triangle, rectangle, or polygon and so on, that serve same  
5 function of the elliptical engagement portions 26 and 72.

The lock device 108 is against the flange 28 of the tube plug 22 while it is moved to the first position. The flange 28 keeps the lock device 108 still in the first position.

The lock device 108 is disengaged with the engagement portions 26 of the  
10 tube plug 22 in the present invention while it is moved to the second position. The lock device 108 also can be designed for disengagement with the engagement portions 72 of the handle plug 68 while it is moved to the second position.